THE INVENTION CLAIMED IS:

1. A method of inspecting a hole using a charged-particle beam, comprising the steps of:

irradiating the hole with the charged-particle beam, the hole being formed in an etched layer on a substrate forming a sample to be inspected;

detecting an electric current flowing between the inspected sample and ground as a result of the irradiation; and

finding the etch depth of said hole into the substrate of the inspected sample, based on a relation of the current flowing between a reference sample and ground to the etch depths of the holes into the substrate, the relation being previously found using the reference sample.

2. A method of inspecting a hole using a charged-particle beam, comprising the steps of:

irradiating the hole with the charged-particle beam, the hole being formed in an etched layer on a substrate forming a sample to be inspected;

detecting an electric current flowing between the inspected sample and ground as a result of the irradiation; and

finding how the hole in the inspected sample is etched, based on relations of the current flowing between a reference sample and ground to etch depths of holes into the substrate and to remaining film thickness in the holes, the relations being previously found using the reference sample.

3. A method of inspecting a hole using a charged-particle beam as set forth in claim 1, further including the steps of:

previously finding a relation of electric current flowing between the reference sample and ground to etch depths of holes into the substrate, using the reference sample;

previously classifying these etch depths into plural groups; and

finding which of the groups does the currently inspected etch depth belong, based on the detected electric current flowing between the inspected sample and ground.

4. A method of inspecting a hole using a charged-particle beam as set forth in claim 2, further including the steps of:

previously finding a relation of electric current flowing between the reference sample and ground to etch depths of holes or a relation of electric current flowing between the reference sample and ground to remaining film thicknesses in the holes;

previously classifying these etch depths or remaining film thicknesses into plural groups; and

finding which of the groups does the currently inspected etch depth belong, based on the detected electric current flowing between the inspected sample and ground.

5. A method of inspecting a hole using a charged-particle beam as set forth in claim 3 or 4, wherein said groups are displayed with different symbols or different pieces of information, in different colors, or with different brightness levels.

6. A method of inspecting a hole using a charged-particle beam as set forth in claim 5, wherein said different symbols or different pieces of information are characters.

7. A method of inspecting a hole using a charged-particle beam, comprising the steps of:

irradiating the hole with the charged-particle beam, the hole being formed in an etched layer on a substrate forming a sample to be inspected;

detecting an electric current flowing between the inspected sample and ground as a result of the irradiation;

comparing the detected electric current with an electric current that is previously found using a reference sample and flowing between the reference sample and ground where the hole is precisely etched; and

judging that the hole in the inspected sample is precisely etched if the two currents agree, that the hole is overetched if the detected electric current is greater than the previously found current, and that the hole is underetched if the detected current is smaller than the previously found current.

8. A method of inspecting a hole using a charged-particle beam as set forth in claim 7, wherein said groups are displayed with different symbols or different pieces of information, in different colors, or with different brightness levels.

9. A method of inspecting a hole using a charged-particle beam as set forth in claim 8, wherein said different symbols or different pieces of information are characters.

10. A method of inspecting holes using a charged-particle beam, comprising the steps of:

irradiating a region containing the holes with the charged-particle beam, the holes being formed in an etched layer on a substrate forming a sample to be inspected;

detecting an electric current flowing between the inspected sample and ground as a result of the irradiation;

repeating these steps for plural regions previously established on the inspected sample;

obtaining data about a distribution of etch depths of the holes in the inspected sample into the substrate, based on the detected current and on a relation of detected current flowing between the reference sample and ground to etch depth of the hole into the substrate, the relation being previously found using the reference sample; and

displaying a map based on the obtained data about the distribution on a display unit.

11. A method of inspecting holes using a charged-particle beam as set forth in claim 10, wherein said map is displayed with different symbols or different pieces of information, in different colors, or with different brightness levels.

12. A method of inspecting holes using a charged-particle beam as set forth in claim 11, wherein said different symbols or different pieces of information are characters.

13. A method of inspecting holes using a charged-particle beam, comprising the steps of:

irradiating a region containing the holes with the charged-particle beam, the holes being formed in an etched layer on a substrate forming a sample to be inspected;

detecting an electric current flowing between the inspected sample and ground as a result of the irradiation;

repeating these steps for plural regions previously established on the inspected sample;

obtaining data about a distribution of etch depths of the holes in the inspected sample into the substrate, based on the detected current and on a previously found relation of electric current flowing between a reference sample and ground to etch depths of the holes into the substrate and also on a previously found relation of the electric current flowing between the reference sample and ground to remaining film thicknesses in the holes; and

displaying a map on a display unit, based on data obtained about the distribution of degrees of etching in the holes in the inspected sample.

14. A method of inspecting holes using a charged-particle beam as set forth in claim 13, wherein said map is displayed with different symbols or different pieces of information, in different colors, or with different brightness levels.

15. A method of inspecting holes using a charged-particle beam as set forth in claim 14, wherein said different symbols or different pieces of information are characters.

16. A method of inspecting holes using a charged-particle beam as set forth in any one of claims 10-15, wherein each of said plural regions is so selected that plural holes are contained therein.

17. A method of inspecting holes using a charged-particle beam as set forth in any one of claims 10-15, wherein said regions illuminated with said charged-particle beam are selected to be in certain positions within a periodic pattern formed on said sample.

18. A method of inspecting holes using a charged-particle beam as set forth in any one of claims 10-15, wherein each of said regions is totally scanned with said charged-particle beam in a scanning period, said electric current is accumulated during the scanning period, and an obtained accumulated value is used as a measurement value about each region.

19. A method of inspecting holes using a charged-particle beam as set forth in any one of claims 10-15, wherein each of said regions is totally scanned with said

charged-particle beam in a scanning period, an average value of said current over the scanning period is taken, and said average value is used as a measurement value about each region.

20. A method of inspecting holes using a charged-particle beam as set forth in any one of claims 10-15, wherein each of said regions is totally irradiated with said charged-particle beam without scanning of the beam in an irradiation period, said electric current is accumulated during the irradiation period, and an obtained accumulated value is used as a measurement value about each region.

21. A method of inspecting holes using a charged-particle beam as set forth in any one of claims 10-15, wherein each of said regions is totally irradiated with said charged-particle beam without scanning of the beam in an irradiation period, an average value of said current over the irradiation period is taken, and said average value is used as a measurement value about each region.

22. A method of inspecting holes using a charged-particle beam, comprising the steps of:

preparing a reference sample precisely etched;

preparing an unknown sample that is not known whether it has been etched precisely or not;

irradiating a region of said reference sample containing holes with the charged-particle beam;

detecting an electric current flowing between the reference sample and ground;

repeating these irradiating and detecting steps for plural preselected regions on said reference sample;

irradiating a region of said unknown sample containing holes with the charged-particle beam;

detecting an electric current flowing between the unknown sample and ground;

repeating these irradiating and detecting steps for plural preselected regions on said unknown sample;

finding data about current distributions on the reference sample and on the unknown sample;

creating graphs indicative of the characteristics of the currents flowing through the regions of the reference sample and unknown sample; and

displaying said graphs side by side on a display unit.

23. A method of inspecting holes using a charged-particle beam as set forth in claim 22, wherein said graphs indicative of the characteristics are formed by plotting detected current values in increasing order, from their minimum values.

24. A method of inspecting holes using a charged-particle beam as set forth in claim 22, wherein said graphs indicative of the characteristics are formed by plotting detected current values in decreasing order, from their maximum values.